

# Sequencing Single Library on Different Platform | Universal Stubby Adapter (UDI)

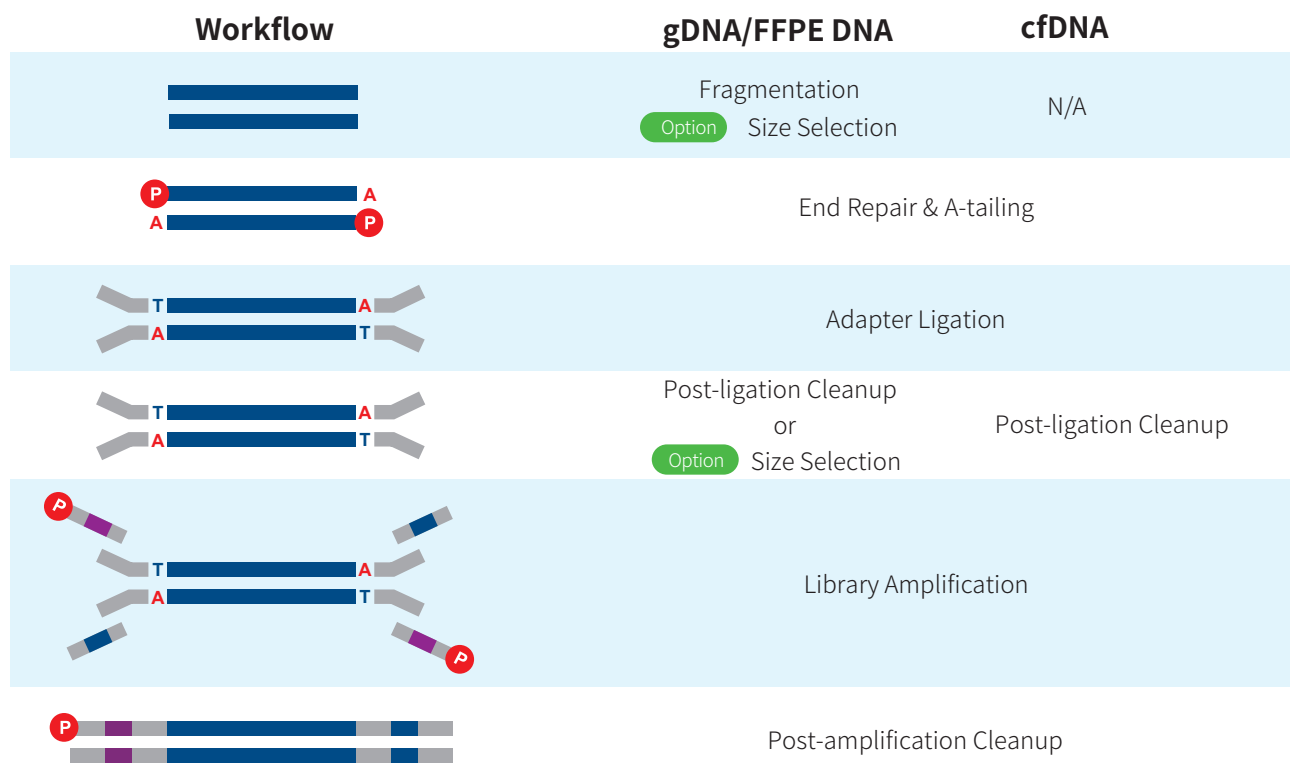
## Background

With continuous innovation in the gene sequencing-related technologies and expanding of its application fields, the industrial competitive landscape is evolving. The MGI sequencing platform consistently generates high-quality sequencing data with lower duplication rate compared to the Illumina platform, and the index hopping issue is greatly alleviated. Currently, increasing numbers of users have both Illumina and MGI sequencers at the same time. Can the same set of libraries be used for sequencing on both Illumina and MGI platforms in order to maximize the productivity?

To solve this problem, MGI has launched MGIEasy Universal Library Conversion Kit (App-A) to convert Illumina platform libraries into single-stranded circular libraries, which allows for sequencing on MGI platform. However, this approach requires an additional 5-10 cycles of PCR amplification, which may introduce amplification errors and eliminates the low duplication advantage of the MGI platform. In addition, Illumina platform libraries include mostly pair-end 8 nt Index, and there are some incompatibilities in the reading the index after transformation.

Therefore, Nanodigmbio has launched a NadPrep Universal Stubby Adapter (UDI) Module. With its newly designed 10 nt Unique Dual Index, the module supports 8 nt or 10 nt Index reading mode on the Illumina platform, and is also compatible with MGI sequencing platform. The libraries can be sequenced directly on MGI platform after circularization without the need for conversion.

## Solution



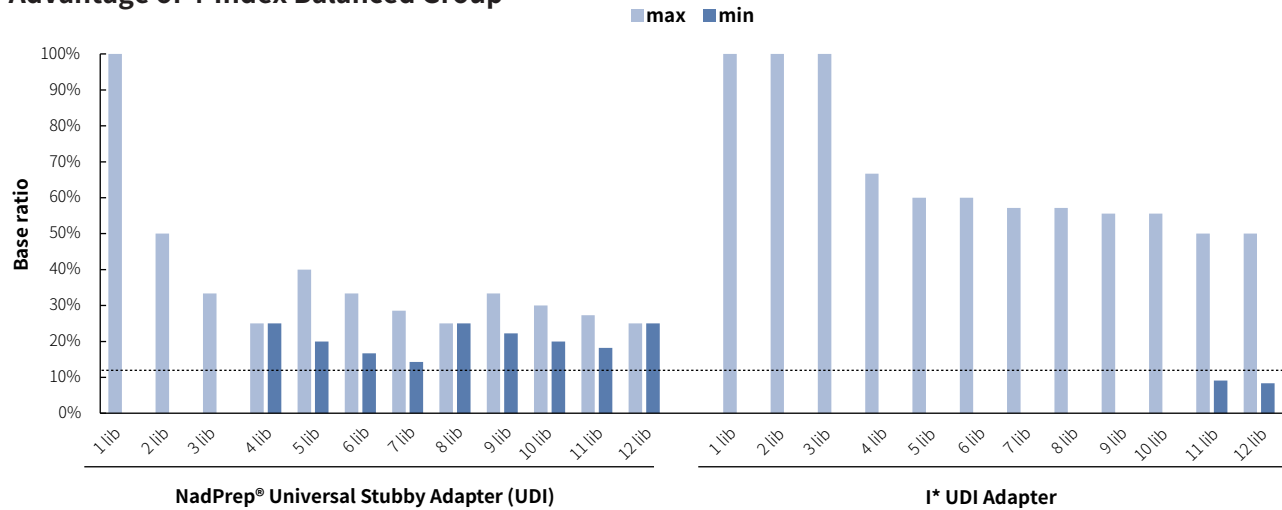
 NadPrep Universal Stubby Adapter

## Introduction

The NadPrep Universal Stubby Adapter (UDI) Module contains universal stubby adapters and 10 nt Unique Dual Index amplification primers. It can be used for preparing libraries with Illumina structures and 5' phosphorylation modification; the libraries can be sequenced on Illumina platform directly and on MGI platform after circularization without App-A conversion. The NadPrep Universal Stubby Adapter (UDI) Module is designed to be 4-Index balanced. It means the minimum balanced group only requires 4 libraries, either on the Illumina platform or MGI platform.

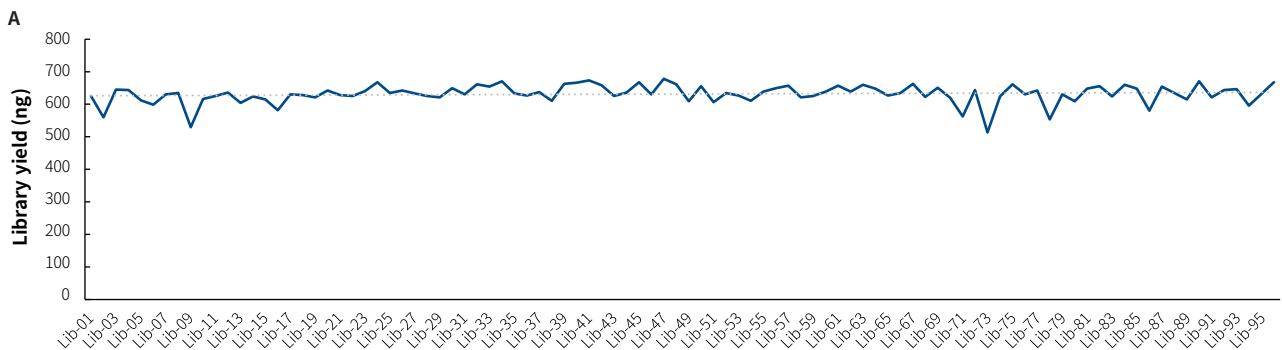
## Performance

### Advantage of 4-Index Balanced Group

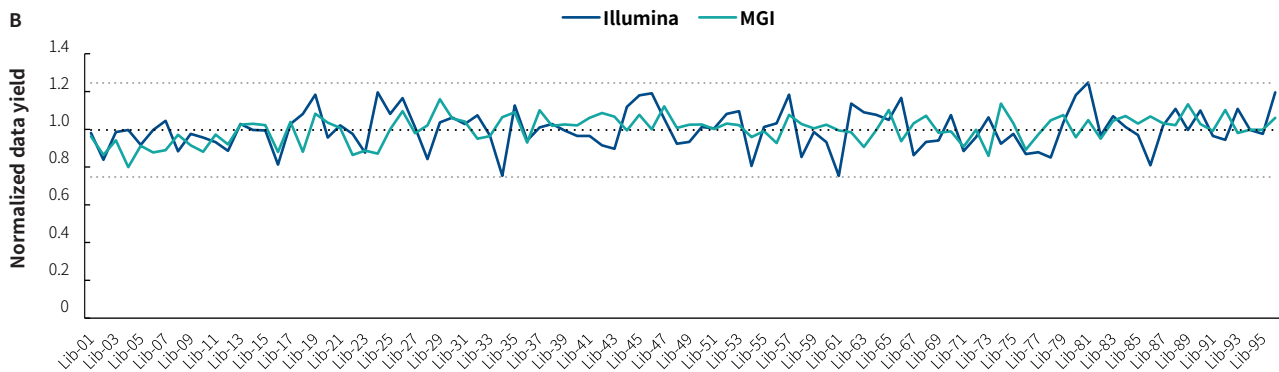


**Fig 1. Advantages of balanced group design of NadPrep Universal Stubby Adapter (UDI).** The NadPrep Universal Stubby Adapter (UDI) Module is designed for 4-Index balanced group: when  $\geq 4$  consecutive indexed libraries are mixed in equal ratio, the ratio of each base in the Index can be  $\geq 12.5\%$  as recommended by the MGI platform. However, some designs of the Illumina platform (e.g., Figure I\* UDI Adapter, P5 #1-12 Index) cannot meet sequencing requirements even with up to 12 consecutive Indexes.

### Uniform Data Output

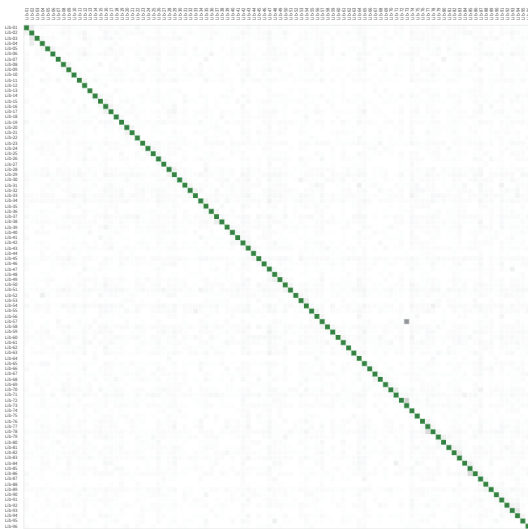


(Continued)



**Fig 2. Performance of the NadPrep Universal Stubby Adapter (UDI).** A. Yield of libraries with 96 Indexes. According to the instructions of NadPrep DNA Library Preparation Kit (for Illumina®), the 50 ng fragmented gDNA (Promega female, G1521) subjects to 5 PCR cycles by using 1 – 96 Index, respectively, resulting in an average library yield of > 10,00 ng; B. Effective splitting rate for libraries with 96 Indexes. Sequencing platforms: Illumina Novaseq 6000, PE150; MGISEQ-2000, PE150.

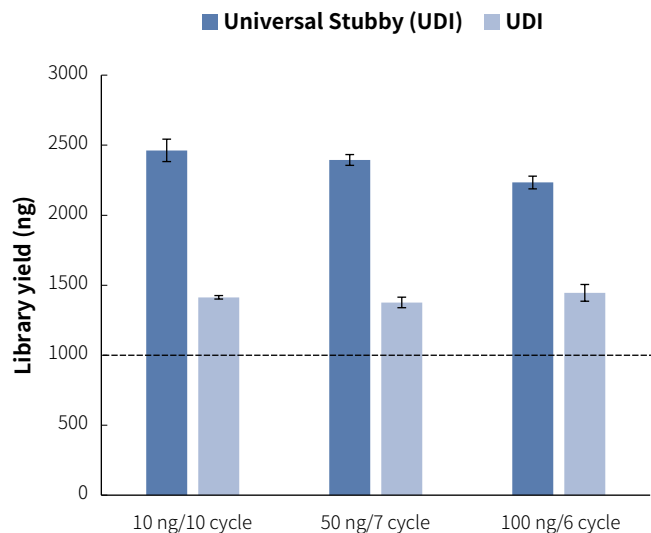
### Effectively Improve Data Accuracy



**Figure 3. The interference analysis of the NadPrep Universal Stubby Adapter (UDI) libraries.** WGS libraries with 96 Indexes were mixed in a single lane for sequencing. Sequencing mode: MGISEQ-2000, PE150.

**Note:** Green represents perfect match pairing barcode percentage > 98.5%.

### High Efficiency and Stability



**Fig 4. Library yield with different types of adapters.** The yields of the libraries prepared with different gDNA initial amount by using NadPrep DNA Library Preparation Kit (for Illumina®) coupled with NadPrep Universal Stubby Adapter (UDI) Module or NadPrep UDI Adapter Module (for Illumina®)

**Note:** The sample is human female genomic DNA (Promega-Female, G1521).

## Ordering Information

Type	Product	Detail	Catalog#
	NadPrep Universal Stubby Adapter (UDI) Module Set A1, 24 rxn	#1-12	1003240
	NadPrep Universal Stubby Adapter (UDI) Module Set B1, 96 rxn	#1-24	1003241
Universal Stubby Adapter (UDI) Module	NadPrep Universal Stubby Adapter (UDI) Module Set B2, 96 rxn	#25-48	1003242
	NadPrep Universal Stubby Adapter (UDI) Module Set E1, 96 rxn	#1-96	1003251
	NadPrep Universal Stubby Adapter (UDI) Module Set E2, 96 rxn	#97-192	1003252
	NadPrep Universal Stubby Adapter (UDI) Module Set E3, 96 rxn	#193-288	1003253
	NadPrep Universal Stubby Adapter (UDI) Module Set E4, 96 rxn	#289-384	1003254

### Statement

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